

SECTION 17200 INTERCOMMUNICATIONS SYSTEM

PART 1 - GENERAL

1.01 SUMMARY.

- A. Provide Intercommunications equipment as specified herein and as shown on the schedules and drawings. Installing contractor shall receive, place, connect, and mount all equipment specified in this Section per the manufacturer's instructions. Installing contractor shall furnish all hardware, wire, connectors, and other necessary items as required for a complete and functional Intercommunications system.
- B. Related Sections:
 - 1. Section 17000 Security Electronics, General
 - 2. Section 17120 Touch Screen System
 - 3. Section 17140 Programmable Logic Controller

1.02 REFERENCES.

- A. Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- B. Underwriter's Laboratories (UL)
 - 1. UL 508 Industrial Control Equipment
 - 2. NEC National Electrical Code (latest edition)

1.03 WORK INCLUDED

- A. Provide relays, terminals, power supplies, intercom amplifiers, paging amplifiers, cabinetry and other equipment as required to install an Intercom System to facilitate a completely function system as shown on the drawings or as specified herein.
- B. Major Sub-systems include:
 - 1. Programmable Logic Controllers (PLC's).
 - 2. Touch Screen Control Stations.
- C. ***There shall be provisions made for the head end equipment to accommodate future audio buss lines to be incorporated into the system from a future housing pod addition to affect audio transfer and control takeover of the future housing pod addition.***

1.04 APPROVALS

- A. General
 - 1. Submittals shall be made in accordance with the General Provisions (Section 17000) of these specifications.
- B. Specific Requirements:
 - 1. Submit catalog cuts for all equipment and devices being furnished under this Section.
 - 2. Submit a complete Intercom System riser diagram. Diagram shall include labeling of each station and the corresponding relay card point for termination, interconnecting

wiring of all components including but not limited to relay cards, intercom amplifiers, paging amplifiers, intercom stations, paging speakers and master intercom stations.

1.05 DESCRIPTION

- A. The relays shall provide the actual switching of audio paths to all intercom stations and paging zones.
- B. All relays shall be mounted in NEMA-1 type cabinets with removable steel mounting plate. The cabinet shall be sized according to the number of relays required by the job and constructed of code grade steel. The cabinets shall be mounted where shown on the drawings.
- C. All relays shall be of the electro-mechanical type. The use of solid state type relays is strictly prohibited.
- D. All relays, terminals and other equipment shall be standard off the shelf, commercially available components.
- E. All intercom station and paging zone termination points shall be permanently labeled in the cabinet.
- F. The PLC shall be the basis of control for the integrated intercom system and shall provide switching and control through a series of input and output points from the PLC.
- G. All intercom controls shall be via the Touch screen control stations.
- H. Existing remote station shall be a re-used.
- I. Existing Paging speakers shall be re-used.
- J. Existing wire and cable for remote stations and speakers shall be re-used.
- K. Each operator position shall have a desk-mounted intercom station employing a microphone and a speaker. The desk mounted intercom station shall be equipped with a push-to-talk switch.
- L. The Programmable Logic Controllers shall provide outputs to automatically call up cameras associated with each intercom station on the control panel's monitor while an intercom link is connected. Camera call-ups for each station are to be determined and at the discretion of the Owner.
- M. For conditions where two CCTV cameras are identified to be viewed upon selection of the intercom, video shall be displayed on adjacent movement control monitors. When a single camera is associated with the intercom selection, CCTV video shall be displayed on one monitor and the adjacent monitor shall be blank.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Except as otherwise specified, herein, or in the General Conditions, the equipment and materials of this Section shall be products of the following listed manufacturers, subject to compliance with the specification requirements and provided each manufacturer meets all requirements of the Quality Assurance Section of this specification. Proprietary or custom units and associated software such as those manufactured by MTI, Icotech, OSS, Simplex and Comtec are not acceptable.
- B. Audio control boards as required to interface to remote intercom stations and paging zones.
- C. Power Supplies. Redundant power supplies shall be provided with alarm reporting of any failed power supply.
- D. Discrete input/output boards.
- E. Intercom master stations.

- F. All software and programming to perform the functions described herein.
- G. Custom interface to the Touch screen control stations and/or Graphic Control panels.
- H. All consoles shall have a gooseneck type, microphone with cardioid pattern, permanently mounted to the top of the console panel.
- I. All consoles shall have volume control for the intercom monitor speaker.
- J. System shall be the Rauland-Borg Intercom Systems, Dukane or approved equal.

K. Intercom Amplifiers

- 1. Rated Power – 10 Watts @ 25 VRMS (balanced).
- 2. Microphone Input – Dynamic, balanced 6 k ohm.
- 3. Auxiliary Input – 20 k ohm balanced (input impedance).
- 4. Telephone Handset – 600 ohm (input impedance).
- 5. Frequency Response Talk – 350 Hz to 4.5 KHz (+0/-3 dB from RPO).
- 6. Frequency Response Listen – 700 Hz to 4.0 KHz (+0/-2 dB from RPO).
- 7. Distortion – Less than 3% at full load.
- 8. Power – 24 VDC @ 1.7 Amps (at RPO).
- 9. Unit shall be Rauland-Borg DCC100 or approved equal.

L. Paging Amplifiers

1. 60 Watt Amplifiers

- a. Rated Output – 60 Watts RMS.
- b. Frequency Response – 40 Hz to 15 KHz ± 1.5 dB at -3 dB below RPO.
- c. Distortion – Less than 3%, 60 Hz to 15 KHz. Less than 2% 70 Hz to 10 KHz.
- d. Noise Level – 84 dB below RPO (input control full on). 90 dB below RPO (input control full off).
- e. Input Sensativity – 0.3 volts for RPO.
- f. Input Impedance – 13,000 ohms unbalanced.
- g. Output Impedance – 10.4 ohms, 25 V line.
- h. Center Tap Balance - $\pm 2\%$.
- i. Output Regulation – Less than 2dB, full load to no load.
- j. Auxiliary Power Available – 1.2 amp @ 28 VDC fully isolated.
- k. Unit shall be Rauland-Borg model DAX 60 or approved equal.

2. 120 Watt Amplifiers

- a. Rated Output – 120 Watts RMS.
- b. Frequency Response – 40 Hz to 15 KHz ± 1.5 dB at -3 dB below RPO.
- c. Distortion – Less than 3%, 60 Hz to 15 KHz. Less than 2% 70 Hz to 10 KHz.
- d. Noise Level – 84 dB below RPO (input control full on). 90 dB below RPO (input control full off).
- e. Input Sensativity – 0.3 volts for RPO.
- f. Input Impedance – 13,000 ohms unbalanced.
- g. Output Impedance – 5.2 ohms, 25 V line.
- h. Center Tap Balance - $\pm 2\%$.
- i. Output Regulation – Less than 2dB, full load to no load.
- j. Auxiliary Power Available – 1.2 amp @ 28 VDC fully isolated.
- k. Unit shall be Rauland-Borg model DAX 120 or approved equal.

M. Intercom Station Card

- 1. Shall contain 26 DPDT relays.

2. Relays – 24 VDC at 25 mA; DPST precious metal contacts.
 3. Each relay shall be hermetically sealed to prevent contact contamination, and have a life expectancy of more than 1,000,000 operations.
 4. Unit shall be Rauland-Borg TZC 25 or approved equal.
- N. Power Supplies
1. Output Voltage – 28 VDC.
 2. Output Current – 2 amps DC.
 3. Power Requirement – 120 VAC , 85 Watts (full load).
 4. Short Circuit Protection – 2 Amp breaker with auto-reset.
 5. Unit shall be Rauland-Borg PSX 300.
- O. Intercom Stations (if required)
1. Intercom slave station shall be a flush-mounted security type with a 3” acrylic impregnated cotton cloth cone speaker. The unit shall have a momentary call-in switch, stainless steel tamperproof hardware, and a backbox. Unit shall have security steel offset grill and a II- guage stainless steel plate. Unit shall mount on a standard three gang 3 ½” deep masonry box. Gangable type boxes shall not be acceptable. Mount unit 48” AFF to top. All units mounted in exterior spaces shall be of the weatherproof configuration.
 2. Intercom stations shall be Rauland-Borg HSS1 or approved equal.
- P. Paging Speakers (if required)
1. 8” dual cone.
 2. Power Handling – 25 Watts peak, 15 Watts RMS.
 3. Sensitivity – 97 dB peak, 94 dB average.
 4. Frequency Response – 45 Hz to 19 Khz nominal,.
 5. Dispersion - 105° (2 Khz octave band, -6 dB points).
 6. Magnet Weight – Nominal, 10 oz.
 7. Shall have a built in matching transformer for both 25V & 70V audio lines.
 8. Shall be Atlas Soundolier C10 Series.
- Q. Exterior Paging Horn (if required)
1. Power rating – 15 Watts continuous.
 2. Frequency Response – 40 to 14,000 Hz nominal.
 3. Sensitivity – 120 dB at 15 Watts (peak).
 4. Dispersion Angle - 70° (-6 dB, 2000 Hz octave band).
 5. Shall be Atlas Soundolier AP-15T or approved equal.
- R. Vandal Proof Speaker Baffle
1. Shall be cast from aluminum alloy with a tensile strength of 44,000 PSI and reinforced with a perforated 22-guage CRS stud-mounting loudspeaker plate.
 2. Shall be matched with the appropriate surface or recessed speaker enclosure.
 3. Shall be Atlas Soundolier VP161-R8.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data; including product technical bulletins, product catalog, installation instructions, submittal sketches or drawings, and product carton instructions for installation.
- 3.02 EXAMINATION
- A. Site Verification of Conditions: Verify that related conditions, including equipment that has been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
 - B. All devices connected to equipment specified in this section shall bear the UL, cUL, or CSA label and comply with all applicable National Electrical Code (NEC) standards.
- 3.03 PREPARATION
- A. Division 17 Subcontractor shall develop custom software as required to effect the functions of the system as dictated by the drawings and Specifications.
 - B. Division 17 Subcontractor shall provide equipment cabinets for installation of the control equipment and cable terminations to the equipment.
 - C. All equipment related to the system shall be factory tested before shipment.
- 3.04 INSTALLATION
- A. Contractor shall furnish all equipment, labor, system setup, and other services necessary for the proper installation of the products/system as indicated on the drawings and specified herein.
 - B. Install in accordance with manufacturer's handling and installation instructions.
 - C. Install in accordance with all local and pertaining codes and regulations.
 - D. All equipment and systems shall be installed by the ESC. Subcontracting of equipment installation shall not be permitted.
 - E. Equipment shall be ready to use condition at end of installation.
 - F. Energize equipment in accordance with manufacturer's instructions.
- 3.05 PROTECTION AND CLEANING
- A. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
 - B. Touch up, repair, or replace damaged components before Substantial Completion.
 - C. Remove temporary tags, coverings, and construction debris from interior and exterior surfaces of equipment. Remove construction debris from equipment area and dispose of debris.
 - D. Clean integral air filters, heatsinks, grills, and fans before Substantial Completion and Commissioning Services.
- 3.06 WARRANTY
- A. The ESC shall provide a single source warranty for all supplied equipment specified in this section to be free of defects in material and workmanship for a period of one (1) year from the date of substantial completion.

END OF SECTION 17200